

241 rodent attack. A hardwood planting stick (ti) is used to loosen the soil, though occasionally shovels are used to make mounds for sweet potato runners and tubers, or for yams. Sugar cane and pitpit are planted either in clumps of suckers or in lengths or 3 nodes but bananas are propagated only from suckers.

Maize, cucurbits and tobacco are planted before or with the main crop of taro. They usually grow best near stumps or logs, perhaps because they benefit from extra potash and humus.¹ Tobacco seeds are thrown near stumps and when seedlings are about 6 inches high they are transplanted throughout the garden. Numerous varieties of taro (*Colocasia* spp.), distinguished by their colour and stem and leaf shape, are propagated by suckers. The suckers are placed in holes 6-8 inches deep and spaced about 2 feet apart. A small amount of *Xanthosoma* taro is planted, usually on sloping ground, and not necessarily in the main gardens. Yams are planted in separate areas if planting material is plentiful. Otherwise they are planted at random through the garden. Two common varieties are recognized.

Sweet potato is grown only in small quantities as a supplementary diet to the taro. If it is planted among the taro, the planting is delayed until the taro is suckering. Small plots are often made in a taro garden after most of the taro has been extracted. Minor crops found in the gardens are cabbage, manioc, beans, tomatoes, ginger, shallots, pineapple and pawpaws. (Table 1.)

Gardens are usually weeded 3 times. Weed infestation becomes too heavy to handle at this stage, but crops are mature enough to compete successfully and shade from the weeds is claimed to benefit the taro.

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(136) Fencing is not as extensive or elaborate as in many Orokaiva areas, due to a scarcity of wild pigs. Gardens are usually made on sites at a distance from the village which is considered too far for domestic pigs to wander. Despite this precaution, 2 men had their gardens spoiled by village pigs just before our visit.

Fences are raised to a height of about 4 feet by piling logs horizontally on a broad base and securing them with perpendicular stakes. In most cases the fence is erected only on the garden border which is considered most accessible to pigs. This is often done after the area has been planted. The barrier may be extended later if another side is found to need protection.

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(476) A virtual absence of wild pigs is partly responsible for the tendency for the gardens to be scattered. In other parts of

¹ Cf. Vicary 1960:188.

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[417] Orokaiva territory where more effort is devoted to fence construction it is more common for the members of a village or a local patrilineal group to cultivate contiguous plots and to co-operate in the construction of one fence to protect several gardens. This reduces the total labour required for the task.

Table 1
Food plants per household*

Crop	Average	Range
Taro (Col)	0.97 acres	0.39 - 2.30 acres
Sweet potato	0.07 acres	0 - 0.20 acres
Corn	223 plants	0 - 442 plants
Bananas	71 trees	35 - 126 trees
Pitpit	88 clumps	0 - 400 clumps
Sugar	34 stools	11 - 54 stools
Yams	63 vines	0 - 136 vines
Taro (Xanthosoma)	28 plants	0 - 91 plants
Native cabbage	22 plants	0 - 100 plants
Faupaw	17 trees	3 - 32 trees
Beans	17 plants	0 - 110 plants
Cucurbits	13 vines	9 - 28 vines
Shallots)		
Manioc)	a few plants	
Ginger)		
Tobacco	18 plants	0 - 59 plants

*12 households.

On the other hand, a total of 1 acre of taro planted in scattered plots involves more clearing than the same area planted in a continuous block of gardens. Several gardens in 1 block would have a smaller total perimeter adjoining the bush where there is usually a margin of cleared land which is never planted. The dispersal of garden sites facilitates natural reseeding of fallow land from the surrounding bush.¹

It is difficult to arrive at an average figure for the length of the cultivation - bush fallow cycle. One particular difficulty is the fact that the clearing of a plot is often done progressively. As one section of the garden plot is cleared by a household, it is planted and then adjoining sections are cleared and planted. In some but not all cases the successive areas may then be allocated to different members in the household, such as a woman - a married sister or a brother's wife - whose husband is absent. Since few vegetables can be stored for long, this method of clearing the

¹ Conklin 1957:145.

241 that is then cultivated contiguously,¹ while in the high density
423 areas there is a tendency towards a more individual pattern of
[613] exploitation.² Short-term rights to land for the non-lineage
members are frequently granted (on a reciprocal basis), sometimes
[425] to facilitate contiguous cultivation or to compensate for inadequate
landholdings. This pattern is promoted by the high degree of
fragmentation of individual holdings. Further to this, Rimoldi
(1966:62, 95) observes that plots are often permanently transferred
[571] outside the direct patrilineal line, and this applies equally to
land under both cash and subsistence crops. In the Inonda area,
however, Crocombe and Hogbin (1963:73-5) observe that there is
considerable reluctance to plant, or make land available for
planting cash crops if the land has not been acquired patri-
lineally, for fear of subsequent disputes. Thus the tenurial
situation may be of considerable significance in the development
of cash cropping.

245 Traditional tree crops are not planted in stands or groups like
cash crop trees, but are widely scattered and may equally well be
428 planted on patrimonial land or on land of affines or matrilineal
kin. Inheritance of rights to trees usually does not involve
rights to the land on which they stand. However, owing to their
wide spacing, their presence rarely seriously affects other cul-
tivation of the land.

¹ The decision-making process has not been investigated but it appears that there is no institutionalised position relating to land matters. An exception is provided by the Yega of the Gona census division who recognise a 'land custodian' (see Dakeyne 1965:55).

² It is possible that this is an expression of the fact that sufficiently large areas of suitable secondary forest are not available at any one time to permit contiguous cultivation. Two other factors are that in low density areas wild pigs and other animals necessitate the fencing of gardens, a task which is easier for contiguous groups than for individuals, and that in forest much wider fringe clearing is necessary than in low second growth. The volume of fringes clearing per garden is much reduced if gardens are contiguous.

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[184] settlements have access to garden land, hunting and foraging areas and creeks but there are considerable variations in availability of these resources, and others such as fish and potting clay. These variations are expressed in the relative significance of the different elements in the work and exchange patterns of different communities.

592 Within the community, the household is the principal economic unit, aiming at self-sufficiency in terms of procuring food, shelter, clothing and production equipment.¹ Thus, gardens are the responsibility of individual households, and the work group for any activity, including clearing and harvesting, seldom exceeds its adult members. Each household produces its own digging-sticks, spears, building materials, sleeping-mats, etc., but axes, bush knives, cooking utensils and clothing are usually obtained from trade stores. For most phases of production co-operation between households is of little importance.

241 A household may maintain between one and five gardens, three being the mean. These average 0.3 acres in size and are generally between five and twenty-five minutes' walk from the village. In some areas, including Inonda and the Yaga area, it has recently become popular to plant kitchen gardens adjacent to the houses, often containing manioc, sweet potato, cucurbits, pineapple and even taro. Bananas, coconut, breadfruit and 'hingi' (betel pepper) trees are often planted at random around the periphery of the village and in the village square.

The process of garden preparation has been described in the articles cited above.² When all but the largest trees have been felled, most of the debris is burned and the remainder piled around the tree stumps. There is no preparation of the soil and crops are planted with the aid of a digging-stick. Gardens are weeded regularly in the early stages, but less frequently as they approach maturity. In the less densely settled areas where wild pigs are common, such as Inonda, most gardens need to be fenced; when separate households have contiguous gardens they usually fence them simultaneously and help each other in this more often than in any other garden task.

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[136] [262] The staple food plant of the Orokaiva is taro (Colocasia) and comparatively small areas are planted with the subsidiary root crops of sweet potato, yams, 'German' taro (Xanthosoma) and manioc. Interplanted with the ground crops are large herbs and trees, such as

¹ Exceptions occur in the case of the elderly or infirm, who are often supported by an offspring's household, and so frequently live in a house adjacent to one or more of them (see Map 4). A

² See p.23.

A, [See Category 102, p. 38--Analysis]

Patterns of activity and seasonal influences

An average of 43.5 hours per man-week are spent on all activities.¹ However, the general level of activity and distribution of time varies widely from week to week and also, in some cases, seasonally (see Table 7:3 and Figures 7:2 and 7:3).

(a) The subsistence sector

(i) Food production. Subsistence gardening is the most important category of activity, accounting for an average of almost 12 hours per man-week. Over half of this time is devoted to taro cultivation, except during the dry season when planting and, in particular, harvesting of taro are reduced, although maintenance increases. Over the year as a whole, the time spent on taro is almost equally divided between planting, weeding and harvesting. For the other crops, however, little time is spent on weeding and most attention is given to harvesting. This is true of sweet potato and yam, which are usually grown in specialised gardens, as well as of minor crops such as corn, cassava and bananas which are usually interplanted with taro. Yams are planted late in the year and harvested in the dry season. Sweet potato is planted both in the dry and early in the wet season, the latter being the main harvesting period, before taro is in full production. Over one-fifth of the 2.1 hours per week spent on minor crops involves coconuts, another fifth bananas and 18 per cent sugar-cane. Eleven per cent is devoted to pitpit but this crop accounts for one-quarter of the total during the wet season. Cultivation of plants that provide edible leaves (*ina*) accounts for 9 per cent of the time spent on minor crops over the survey, but 29 per cent in the dry season. Corn and pumpkin account for about 5 per cent each.

Clearing of gardens takes place throughout the year, most in dry spells at the onset of the wet season when newly planted crops will benefit from the rain. In February and March 1964, during the wet season, there was an unusually high rate of clearing after a flood in January destroyed several gardens containing maturing crops. During period II (the dry season), the rate of clearing was comparatively slow, partly because the season was abnormally wet and partly because of the large amount of time invested in fencing, which is necessary particularly at this time since feral pigs from more remote bush areas tend to invade the gardens for food. Clearly, the protection of growing crops has a higher priority than the establishment of new gardens.

During the dry season, food-producing activities other than gardening increase in importance, and sago-making is concentrated

¹ See, however, the adjustment for additional data, pp.136, 138.

241 to Inonda men, and his three son-in-laws assisted him to make the garden, which covered an area of 2.32 acres.

241 Fencing: Wild pigs living in the nearby forest are
41 always a menace to the food crops and the people erect fences and set traps to protect their gardens. The first panel of a fence is built where the people consider that pigs are most likely to enter the garden (usually the side facing the forest). Often, no further fencing is done until a pig enters the garden through an unfenced area. Then another panel may be built and this sequence is continued until the garden is almost pigproof. Natural barriers such as steep-sided creeks and large fallen trees are incorporated into the fences whenever possible. Households with neighbouring gardens often work at the same time (but independently) in order to reduce the amount of fencing required to surround the garden area.

[46] All members of the household help with fencing but most of the heavy work is done by men. Straight green saplings about two inches in diameter are cut into stakes six feet long and thrust into the ground in pairs about nine inches apart with two feet between pairs. Logs of up to six inches in diameter are then either brought from the garden where they have been stacked after clearing, or are cut from the forest. They are piled horizontally between the pairs of stakes to a height of four to five feet, and the stakes are lashed together with wagesi vine to hold the logs in place. The warm moist climate causes fences to decay rapidly but they usually remain effective for about a year, by which time all but the latest-maturing garden products have been harvested.

241 Hunting, fishing and foraging: Inonda is more fortunate than many Orokaiva villages in that it has few people and extensive hunting lands. In fact the greater part of the total land area is used only for hunting and foraging. During the first month of our stay, ten wild pigs were speared or shot - a considerable quantity for a village of eight households. In addition, birds, bandicoots and other game were killed. One of the villagers owns a gun which he makes available to others and this has in all probability reduced the time spent in hunting and at the same time increased the product.

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The following rough assessment of total days expended on various tasks per year has been made.

Subsistence	Assessed man-days per year (adults only)		
	Men	Women	Average
<u>Bush clearing:</u> 1.1 acres per adult male. We assume that men take about 10 man-days to clear an acre, and are assisted by their women-folk during 4 man-days.	10	4	7
<u>Planting:</u> 0.5 acres per adult per year shared roughly equally by men and women assuming 8 man-days per acre of planting.	4	4	4
<u>Weeding, maintenance and harvesting:</u> 25% above pilot survey for although during that time harvesting was increased, weeding was reduced due to funerary commitments.	19	109	64
(47) <u>Fencing:</u> One household of 6 adults (incl. 2 visitors) and 2 children erected 239 ft. of fence in 6 hours. Another household of 3 adults built 145 ft. in 8½ hours. This suggests that an adult, as a member of a team, can construct approx. 50 ft. of fence per day. There is a total of 7, 148 ft. of intact pig-fence around the food gardens which was constructed during the 12 months preceding our survey. On the average therefore each household makes about 900 ft. of fence per year, which would require approximately 18 man-days per household, or about 7 days work per adult per year. (1)	7	7	7

(1) Wild pigs are most prevalent in the areas which border the Hydrographers Range. In the central parts of the Orokaiva country there are few wild pigs and the people do not build fences. This saves them time but, on the other hand, they cannot supplement their diet with fresh meat to the extent that the "border" people can.



Fig. 6. A Yega swidden. Notice the variety of interplanted crops which here include maize, taro, sugar cane, pineapple, paw paw, and bananas. The fence, built to keep out wild pigs, is about five feet high

241 b) *Fencing*. Most Yega swiddens are fenced,
 at least partly, against the depredations of wild
 pigs (Fig. 6). Since fencing is a tedious task,
 natural features such as steep creek banks are
 utilized as fully as possible. But frequently one
 finds a swidden entirely fenced except for a
 gap left purposely to tempt the pig to enter
 the garden. A trap is then set, or a hunter takes
 his stand nearby at night. When the gap is
 not being used for hunting purposes, a fire
 is lit or pieces of rag are hung there; pigs
 scenting human beings will not then enter
 the garden.

241 c) *Division of labour*. Most garden work is
 462 performed by both men and women, but cut-
 ting large trees is men's work only, and harvest-
 ing is performed by women only. Incidentally,
 482 the women also carry the loads of vegetables
 weighing sixty to seventy pounds back to the
 villages, often three or four miles, sometimes
 with a load of firewood and a baby on top.

262 d) *Sago production*. Sago is an important
 supplementary food; it is particularly impor-
 tant as a famine reserve. During an unusually
 long dry period in 1965 the Yega and their
 neighbours were reduced to living, for some
 months, almost exclusively on sago. Production
 is a tedious process. Sago is a starch which,
 with fibre, makes up the internal bulk of the

[P.9-B)

- 372 sea breezes, during the dry season (May to August) drive fires across the grasslands against the forest wall.

HOUSING AND VILLAGE LIFE

- 342 The Yega make three types of buildings each with a separate function; the vernacular names for these buildings are *mando*, *dobo* and *gaga*. The *mando* is the building where a man and his family normally live. It is a well-built structure about sixteen to twenty feet by twelve to sixteen feet, set on hardwood piles, with the floor about four feet above the ground. The framework is of untrimmed bush poles about four to six inches in diameter, nailed together (the fifty or sixty cents for nails is the only cash expense in building the house). The floor is of split lengths of limbon palm, laid with the convex trunk side uppermost so that there are no splinters. Walls are made of lengths of the two inch thick midrib of sago palm fronds lashed vertically. The lashing usually leaves a space of quarter to half an inch between each pair of strips allowing any cooling breeze to blow through at all times. The roof is thatched with sago-leaf 'tiles'. The house is divided internally into two or three rooms, with a verandah in front. (824) The entrance ladder is frequently the worst constructed part of the house. It is often rickety and dangerous, but even small children and dogs seem to negotiate it without falling. (417) Cooking is usually done in front of the house or, in wet weather, underneath it. Some houses have a mud hearth three feet square and four inches thick, or the top of a forty-four gallon drum covered with two inches of sand, in one of the rooms to serve cooking and heating purposes. Food is cooked in a pot balanced over the fire on three stones or, nowadays, on three empty meat tins. Furniture is simple. 252 There are no tables, chairs, or bedsteads. 354 Sleeping mats are of woven pandanus leaf. There is often a light blanket or two, baskets and bags hang from the ceiling and in every house is a box or suitcase containing the wife's shell jewellery and the husband's ceremonial dancing finery, woven bracelets, feather head dresses, and shell and dog-teeth masks. Another box or suitcase contains the couple's

[P.10-B]